

## Golf Ball Impulse Lab

### Honors Physics

20 Points Total

The goal of this lab is to determine the force of the ground on the golf ball (or the golf ball on the ground) by measuring time, mass, initial height, and rebound height and calculating the initial and final velocities and compare the experimentally determined force to the theoretical force.

#### Instructions:

1. Place the meter stick on the ground and the top of the golf ball at 0.5 m.
2. Place a laser timer on the floor so that the golf ball will bounce between the two ends.
3. Release the golf ball and catch it when it returns to its maximum rebound height.
4. Record in a data table the time, initial height, and final height.
5. Repeat the experiment 9 times for a total of 10 trials.
6. Measure the mass of the golf ball.
7. Take an average of the times and final heights to use in the calculations, and calculate the force of the ground on the ball (or the ball on the ground).
8. If we assume a perfectly elastic collision, the return height of the golf ball should be 0.5 m. Perform the calculations again with the final height as 0.5 m.

#### Rubric:

1. Procedure (2).
2. Data table (3).
3. Calculations of force using measured data (3).
4. Calculations of force using a return height of 0.5 m (3).
5. How do the answers to #3 and #4 compare (1)? What accounts for their difference (2)?
6. Sources of error and ways to minimize the error (4 points; 2 each).
7. Conclusion (2). [What you expected, what you found, how they were different]